

Teaching our Teachers

Colleges of Education Under Increasing Attack As Weak Link in the Drive To Improve Nation's Schools

By Lynn Olson

Battered from the outside and subject to increasing scrutiny from within, teacher training remains one of the most troubled and castigated enterprises on the educational landscape.

In a report released last month, Lynne V. Cheney, chairman of the National Endowment for the Humanities, states, "We force prospective schoolteachers to take education courses that waste their time."

Such courses "are more likely to confuse and mislead than to enlighten," she asserts, adding that they are "intellectually demeaning."

An October article in *Newsweek* magazine, titled "The Failure of Teacher Education," quotes John Silber, the president of Boston University, as saying, "The best thing that could happen to most schools of education would be closing them."

Last summer, when Gov. Garrey E. Caruthers of New Mexico proposed a similar solution at the annual meeting of the Education Commission of the States, his proposal received a surprisingly high level of approbation.

As State Representative Wilhelmina Delco of Texas notes: "Ninety percent of reality is in the perception. And the perception of teacher education is bad."

Even classroom teachers look back with derision on their professional-education programs.

In a 1987 survey of 22,000 teachers conducted by the Carnegie Foundation for the Advancement of Teaching, 40 percent rated their preservice professional preparation as "fair" or "poor."

Fewer than 15 percent of those surveyed in a 1986 study for the National Education Associ-



Joyce Potochney, a senior in the teacher-training program at Towson State University in Maryland.

ation judged their undergraduate courses in education as a "definitely effective" source of job-related knowledge and skills.

Though evidence suggests that the level of disgust with teacher education is higher than ever, current complaints about how teachers are trained fall into four broad categories that have changed little since the outset of the 1980's:

- Although the academic quality of prospective teachers has improved, teaching is still not attracting "the best and the brightest."

Moreover, at a time when an increasing number of particularly gruesome cases of alleged sexual abuse and misconduct among teachers have been reported, scant attention has been paid to the moral characteristics of those who would teach.

- While a growing number of states require future teachers to declare a liberal-arts major, educators still lack a deep understanding of the content they teach.

Simply requiring an academic major may be an attractive—albeit ineffective—solution to the problem, many say.

- In large part because teacher educators have failed to make the case for professional-education courses, the value of courses in pedagogy has still not been recognized.

The result is that several states have placed stringent limits on the number of such courses that future teachers can take. And even insiders admit that these courses are often incoherent, ill-conceived, and poorly taught.

- Prospective educators are spending more time than ever in the schools, but the quality of their fieldwork may not have improved.

The result is a shocking "discontinuity" between what students learn on campus and what happens in classrooms, as well as a disheartening perpetuation of the status quo, according to Willis D. Hawley, director of the center for education policy at Vanderbilt University.

Such troubling and fundamental concerns, educators maintain, should send up a red flag for anyone worried about the future of the nation's schools.

As John I. Goodlad, a professor of education at the University of Washington, notes, "If we are going to reform our schools, then we ought to be looking at the teachers who are going to teach in those schools."

As report after report has made clear, tomorrow's schools will have to be substantially different from today's.

By the year 2000, the majority of American schoolchildren will be members of a minority

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group—many of them from home and community backgrounds that are not particularly conducive to learning or familiar with the tenets of a democratic society.

At the same time, the expectations for American education are growing to reflect an increasingly high-technology economy. Schools that were once content to emphasize rote memorization must now teach students how to think for a living and how to continue learning on the job.

Far from keeping pace with such trends, critics allege that teacher education remains mired in the past.

"There's a lot of tension about the fact that teacher preparation is not in tune with practice," says Kenneth L. Peatross, executive secretary of the Minnesota Board of Teaching, "that, somehow, preparation is not keeping abreast of the advances that are being made in teaching and learning; that veteran teachers are out there floundering around and learning on the job; and that teacher education is blithely going along preparing people for 1950."

The result, according to both fans and foes of teacher education, is that the preparation of educators needs a major overhaul, not just a ratcheting up of the current system.

While many programs have been struggling to reform, most assert that changes have not come fast enough or been made deep enough.

"I think terms like small modifications, tinkering, and so on are still appropriate to describe our situation," says Richard Wisniewski, dean of the college of education at the University of Tennessee at Knoxville. "All of us can point with some pride to some pilot program that we say is doing it right, but the mainstream of teacher education has yet to be challenged."

Troubled Past, Troubled Present

Ironically, the current movement to reform the public schools has largely ignored

the teaching of teachers.

Not one of the President's six national education goals mentions teachers. And most state attempts to reform teacher education have been cursory and simplistic, critics maintain.

In general, states have focused on stiffening admissions requirements for teacher-training programs, mandating liberal-arts majors, and increasing the amount of time that prospective teachers spend in the schools.

Rarely have such requirements been accompanied by a substantial infusion of new money for teacher preparation.

Such a situation is hardly surprising given the history of teacher training in the United States.

Since their inception as "normal schools" in the 1830's, dedicated to the practical instruction of elementary-school teachers, teacher-preparation programs have been widely viewed as anti-intellectual and dubious in status.

As early as 1840, the Massachusetts House committee on education questioned the necessity of teacher education at all. It appeared to them, panel members wrote, "that every person, who has himself undergone a process of instruction, must acquire, by that very process, the art of instructing others."

And in the 1950's, the historian Arthur Bestor called teacher preparation "a fraud upon the teachers themselves and upon society as a whole."

It did not help that, from the outset, much of teacher preparation was devised apart from—and subservient to—the university, where professors and other academicians were trained. Nor did it help that most of the students who flocked to the early normal schools were women, of whom little was expected in the form of academic rigor or achievement. Problems of low status and low pay have plagued the profession ever since.

Just last month, in one of the most comprehensive studies of teacher education ever conducted, Mr. Goodlad described such programs as the stepchildren of the university, suffering from "chronic prestige depriva-

tion," a lack of clear mission, incoherent programs, and inadequate funding.

Colleges and universities that are not prepared to shape up their teacher-education programs, he contends, should get out of the business.

'Simultaneous Change' Needed

Today, there are more than 1,200 institutions nationwide that prepare teachers—about twice as many as some educators think the nation can afford.

They range from small liberal-arts colleges to giant regional universities to elite research institutions. And they turn out approximately 91,000 teachers a year at the undergraduate level, where most teachers are still trained.

"In my opinion, the range in quality among colleges of education in any given state is probably wider than the range in quality among high schools," says David C. Smith, dean of the college of education at the University of Florida at Gainesville.

How to bring the majority of them into the 21st century, many maintain, should be one of the burning questions of the 1990's.

For as Mr. Wisniewski of the University of Tennessee notes: "Any assumption that we can dramatically change education without simultaneously examining the structure and content of schools of education simply is not realistic."

"If we assume that we're going to have new teachers for new schools for new generations," he asserts, "the institutions that prepare teachers are going to have to go through exactly the same change processes that we're advocating for the schools."

Recruiting Smarter People The 'Most Significant' Change?

One of the most prominent complaints about teacher education in the early 1980's was the dearth of high-quality candidates.

That perception was reflected in 1983 in *A Nation at Risk*, when it noted that too many teachers were being drawn from the bottom quarter of graduating high-school and college students.

Since then, 45 states have taken steps to improve the caliber of prospective teach-

ers, either by limiting entry to teacher-education programs or by imposing new requirements for licensure.

Today, 21 states require students to demonstrate a minimum level of competency on state-prescribed tests before entering a teacher-education program—usually, a basic-skills or college-admissions exam.

Fifteen states require students to have achieved a minimum grade-point average in their prior college or university courses. Twelve states require both a minimum G.P.A. and a test.

In 1985, the National Council for Accreditation of Teacher Education also required that the programs it approves admit only those students who have maintained at least a 2.5 grade-point average and demonstrated proficiency in the basic skills.

According to a survey conducted by the Southern Regional Education Board in 1988, such changes have made institutions more selective. Half of the colleges and universities studied reported that they were accepting a lower proportion of applicants than in previous years.

In the S.R.E.B. survey, education deans characterized the increased rigor of the admissions process as "the most significant change in teacher education in this decade."

Today, studies suggest that prospective teachers have an academic profile—in terms of high-school grades and test scores—comparable to that of other college-going students.

Mr. Goodlad's study of 29 representative teacher-training institutions nationwide found that nearly all had raised their academic requirements for admissions.

"Perhaps this accounts for an academic showing among candidates that ran somewhat counter to conventional wisdom," he writes. More than 70 percent of the undergraduates in his study had grade-point averages of 3.0 or higher.

"Over all," he adds, "education faculty members viewed students in their teacher-education programs as of average scholastic ability compared with students on the campus generally."



Teacher-education students at Vanderbilt University. Willis D. Hawley, director of a policy center there, believes teacher education has contributed to its graduates' dissatisfaction by teaching the wrong things at the wrong time.

Total Enrollments in Schools of Education, Fall 1989

Racial/Ethnic Group	Total	%
White	426,748	86.5
Black	33,436	6.8
Hispanic	13,533	2.7
Asian/Pacific Islander	4,469	—
Native American/Alaskan Native	2,282	—
Other	13,138	2.7
TOTAL	493,606	100.0

Undergraduate Enrollment in Schools of Education By Academic Field and Race/Ethnicity, Fall 1989

Academic Field	Total	White %	Black %	Hispanic %	Asian %	Native %	Other %
Early Childhood	23,491	84.5	10.7	1.6	—	—	2.2
Elementary	130,704	90.1	5.0	2.6	—	—	1.1
Secondary	95,537	90.3	4.9	2.2	2.6	—	1.6
Special	22,871	86.3	9.0	1.8	—	1.0	1.3
Bilingual	923	37.6	2.5	52.3	1.4	2.1	4.1
Vocational	4,128	75.9	15.3	5.6	—	—	2.5
Other	23,062	80.3	12.6	2.4	—	—	3.7

Base: 685 schools of education nationwide * Percentages may not total 100 percent due to rounding.

Source: "Teacher Education Enrollment Survey, Fall 1990," American Association of Colleges for Teacher Education



The school-reform movement has largely ignored the teaching of teachers. Not one of President Bush's six education goals, for instance, mentions teachers.

Meanwhile, enrollments in teacher-training programs have increased 65 percent in the past five years, even as colleges have raised their admissions standards.

Media coverage regarding the need for new teachers, sharp rises in teacher salaries, and changing demographics all appear to have contributed to a surge in teacher-education enrollments and to an overall improvement in the quality of prospective educators.

Banning the 'Least Competent'

But others caution that the new admissions requirements have raised the average profile of education students by eliminating the bottom of the barrel, not by attracting the "best and the brightest."

"By itself," cautions Arthur E. Wise, president of NCATE, "such steps merely rid the system of the academically least competent."

According to a 1989 report by the Association of American Colleges, titled *Those Who Can: Undergraduate Programs To Prepare Arts and Sciences Majors for Teaching*, "while there has been progress, teaching still is not attracting aspirants of the quality and diversity it needs."

Quoting the findings from a 1988 report of the Cooperative Institutional Research Program, the A.A.C. report notes that first-year college students intending to enter teaching are, in disproportionate numbers, pursuing their education in less selective colleges and universities.

Within any given type of institution—all four-year Catholic colleges, for example, or all public universities—the percentage of first-year students wanting to teach drops as the institutions themselves become more selective.

For example, while 7.4 percent of first-year women in private universities classified as having "low selectivity levels" intended to teach, only 1.8 percent of first-year women in highly selective private universities intended to do so.

"Across this country, there are way too many institutions preparing teachers," says Kenneth R. Howey, professor of education at Ohio State University, "and so there's real unevenness of quality in both the programs and in the corpus of students who enter those programs. You've got everything from fine liberal-arts institutions with a select group of students . . . to institutions that basically have open enrollment and are under pressure to survive."

State attempts to get tough with institutions whose education students do not measure up also appear to have had a limited effect.

In those states that have required 70 percent to 80 percent of the students in a given teacher-education program to pass state-licensing exams in order for the program to remain certified, few programs have lost their approval for failing to meet the criteria.

Not only have all the institutions succeeded in meeting the standard after a year or two, but several state officials reported that students who took and failed such tests never applied for a teaching license, making it almost impossible for the requirement to be monitored.

'Skittish' About Morals

Others argue that by relying too much on grade-point averages and test scores, the admissions process has overlooked other equally fundamental questions about prospective teachers, including whether they can relate well to children or work cooperatively with adults.

Mr. Goodlad's study found no admissions criteria "tied to the moral, ethical, and enculturating responsibilities" of future educators.

"Every campuswide teacher-education council I interviewed was skittish about discussing its role in selecting and monitoring candidates for teaching on criteria beyond the academic," he writes. "Their concerns with broadened criteria centered on potential legal problems and fear of litigation."

Only a handful of institutions—such as Central Michigan University—have attempted to give the attitudes and interests of prospective teachers a substantial amount of weight in their admissions decisions.

In states where the very existence of an institution's teacher-education program depends on its graduates' performing well on teacher-licensing exams or beginning-teacher assessments, adds Mr. Goodlad, the tests themselves may be having a negative effect on the curriculum, narrowing it in much the same way that standardized tests have been accused of emaciating the curriculum in grades K-12.

Keeping Minorities Out?

Finally, several studies have suggested, standardized tests are keeping minority candidates out of teaching, at a time when the proportion of minority students in the

nation is expected to reach 30 percent by the year 2000.

According to a report by the Educational Testing Service, regardless of the type of test used or the area assessed, minority candidates have substantially lower passing rates than do majority candidates.

Partly as a result, the percentage of minorities in the teaching force is projected to decline over the next 15 years from 10 percent to less than 5 percent.

Meanwhile, estimates suggest that the current population of undergraduates intending to teach is more than 85 percent white and 80 percent female.

In response to such concerns, the state of Florida has allowed each teacher-training institution to waive rigid admissions criteria for up to 10 percent of its student body, in the hope of attracting more minority candidates.

Knowing One's Subject: Still an Elusive Goal

Another complaint that has dogged teacher education throughout the 1980's is that prospective educators know too little about the subjects they will teach.

After analyzing the transcripts of more than 6,000 undergraduates in 17 institutions in 1985, the S.R.E.B. concluded that teacher-education students on average completed a weaker general-education curriculum than their arts-and-sciences counterparts; took fewer courses in the liberal arts at the upper levels; and had less coursework in English, mathematics, the physical sciences, economics, history, political science, sociology, foreign languages, philosophy, and other humanities.

The report also found that future teachers often took academic courses in sections specifically designated for them, apart from other students. Even prospective high-school teachers, who typically majored in an academic field, completed fewer credits in their majors and less of their coursework at the upper level than did their peers headed for other careers.

Partly in response to such concerns, at least a dozen states—including California, Connecticut, Massachusetts, Mississippi, New Jersey, New York, Rhode Island, Tennessee, Texas, Vermont, Virginia, and Washington—have adopted policies requiring prospective teachers to major in a liberal-arts discipline.

Some states, such as Connecticut or Mississippi, also allow for an interdisciplinary major or an academic minor for prospective elementary teachers.

According to teacher educators, such requirements have had some effect, but probably not as much as lawmakers had anticipated.

Most prospective high-school teachers already majored in the subjects they planned to teach and were virtually untouched by the new requirements.

"As far as secondary education is concerned, there's probably been no change whatsoever," says David E. Kapel, dean of the school of education and related professional studies at Glassboro State College in New Jersey.

Confusion Reigns

For prospective elementary teachers, the requirements have made more of a difference. But the pattern is confusing, with wide variations both within and among states.

Virginia, for example, requires that all future teachers complete a liberal-arts major. At Virginia Commonwealth University and the University of Richmond, future elementary teachers can select any major they want.

Virginia Polytechnic Institute allows students to choose between an interdisciplinary

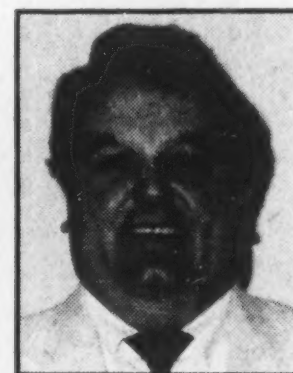
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Michael Anderson

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—Lynne V. Cheney



There's a lot of tension about the fact . . . teacher education is blithely going along preparing people for 1950.

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All of us can point with some pride to some pilot program . . . but the mainstream . . . has yet to be challenged.

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plinary arts-and-sciences major and a major in child development that includes coursework in most of the subjects they might teach. Norfolk State University enables students to select from among an interdisciplinary major, or a major in English, history, or social studies.

In New Jersey, says Nicholas M. Michelli, dean of the school of professional studies at Montclair State College, many prospective teachers are now majoring in psychology.

Within the field itself, the debate still rages about what subject-matter knowledge elementary teachers need.

"I don't think we're unified at all about what it means to make an intellectually more solid preparation for elementary teachers," says Nancy L. Zimpher, an associate professor of education at Ohio State who, along with Mr. Howey, has written a book on the preparation of elementary educators.

A 'Misleading' Solution

Similarly, while many institutions have required prospective teachers to take more general-studies courses, few appear to have re-examined those general-education requirements in depth.

"The colleges and universities in our sample left to students in teacher education either the choice of arts-and-sciences courses within the general-education specifications of the institution or the choice of courses within broadly defined domains such as the humanities, social sciences, mathematics, and the natural sciences," Mr. Goodlad writes.

"Is one course about as good as another for teachers as long as it is designated as an option satisfying the institution's general-education requirements, as this free-choice

approach suggests?" he asks. "I think not. Nor do I think students possess the information they need to make informed, intelligent choices."

Unlike medical schools, which require their students to have completed a highly specified undergraduate curriculum, notes Linda Darling-Hammond, professor of education at Teachers College, Columbia University, "We haven't developed a conception at this point of something that might be called a pre-ed major."

"The medical-school curriculum is based on the assumption that people come to medical school with certain things under their belt," she maintains. "Because this has been done willy-nilly in education, with some kind of magical thinking about having a disciplinary major meaning something special, we really don't have any conception of how to build an education curriculum on top of whatever that major may turn out to be."

In its 1986 report, "Tomorrow's Teachers," the Holmes Group, a consortium of research universities dedicated to the reform of teacher education, frankly admitted the weakness of most students' subject-matter preparation.

But it placed the blame at the door of the entire university, not just the colleges of education, which provide little, if any, of a teacher's subject-matter training.

According to the report, "the traditional course of study in an academic major, in its premature rush to specialization and vocational preparation, often fails to elaborate the structure of the discipline, its origins and goals; and ignores criteria that cause some issues to merit deep study and others to be merely interesting or trivial."

Such majors, the report asserts, may be inappropriate for all students, not just prospective educators.

"The really misleading piece of this," says Frank B. Murray, dean of the college of education at the University of Delaware,

"is that you can require a major and think you've solved the problem."

"In fact," he suggests, "you've compounded your problem, because the major is about something else. It's about entry-level employment or getting into graduate school. It's got nothing to do with whether or not you can teach your subject."

In fact, research now suggests that knowing a subject well may not enable someone to teach it.

In addition to strong preparation in an academic discipline, future teachers may require something called "pedagogical content knowledge"—or information about how to teach a particular concept, like negative numbers, to students of varying ages and abilities.

"Should that come out of subject-matter courses?" asks Mary M. Kennedy, director of the National Center for Research on Teacher Education at Michigan State University. "Should it come out of a whole series of subject-specific methods courses, or what? I don't think anybody has a clear, obvious answer to that."

Making the Case For Professional Studies

Meanwhile, many of those outside teacher education continue to question the very heart of the enterprise: the necessity of professional-education courses.

"The place that we have not done an adequate job right now," says Judith E. Lannier, president of the Holmes Group and executive director of the Michigan Partnership for New Education, "is on the professional studies that the education school itself assumes primary responsibility for."

"People understand that you need the arts and sciences," she asserts. "People understand that you need schools of best practice. And then they say: 'What do the education schools do?' I think we've done least well in articulating the important learnings for which the education school must

be held responsible."

The rapid proliferation of alternate routes into teaching during the 1980's reflects the public's lack of faith in the value of professional preparation.

Estimates suggest that between 33 and 48 states now offer such programs, which allow individuals to earn a state teaching license without completing traditional teacher training.

Although some of these programs are trying to provide innovative ways for older college graduates to become teachers by emphasizing classroom experience and compressing the time spent on pedagogy, others are little more than rubber stamps into the profession.

In addition, the widespread belief that prospective teachers are taking too few liberal-arts courses and too many courses in pedagogy has led several states to limit the number of education courses required of prospective teachers, even within traditional programs.

New Jersey, for example, confines a prospective teacher's professional education to 30 semester hours, including student teaching. Virginia limits such coursework to 18 hours, excluding student teaching, unless a university decides to offer a five-year program. And Texas has placed an 18-hour cap on teacher training, including all fieldwork.

'Fearful' for the Future

The result has been the wholesale elimination of courses on some university campuses and attempts to shoehorn more and more knowledge into less and less time.

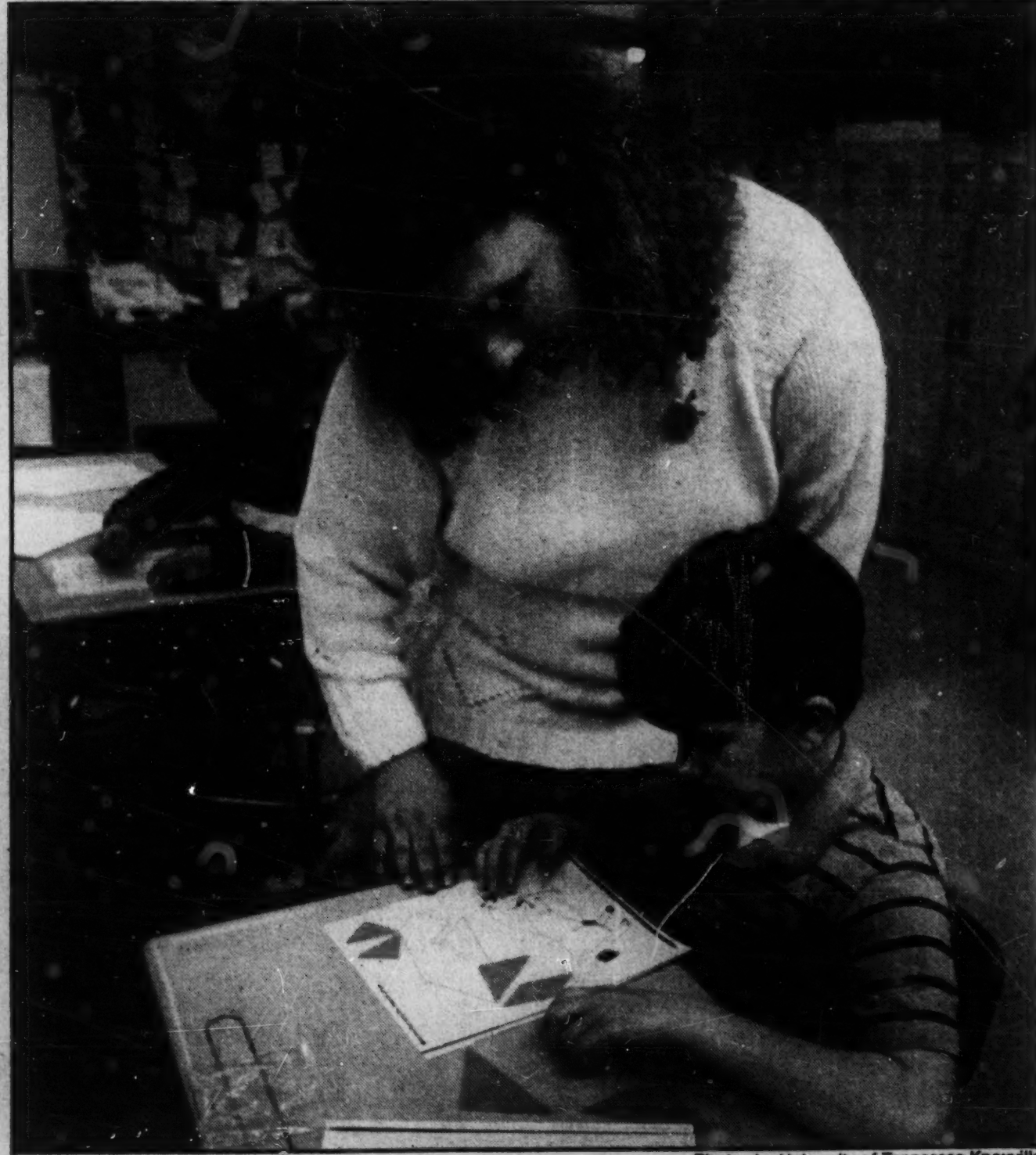
V.P.I., for example, dropped six semester hours of instruction, including a course in tests and measurements and one in instructional technology.

Hardin-Simmons University in Texas dropped two methods courses, a course on multicultural education, and one on classroom management.

Corpus Christi University, also in Tex-



Teacher-education students at the University of Tennessee at Knoxville. Tennessee is among at least a dozen states—others include California, Connecticut, Massachusetts, Mississippi, New Jersey, New York, Rhode Island, Texas, Vermont, Virginia, and Washington—that have adopted policies requiring prospective teachers to major in a liberal-arts discipline.



Photos by University of Tennessee-Knoxville

as, replaced specialized methods classes in math, science, social studies, and language arts with one generic course.

At several institutions, including the University of Texas at Austin, officials say the new requirements have forced them to create tighter and more articulated programs. Others admit that there was some duplication and redundancy in the curriculum.

But by curtailing professional education to at most four to six courses, teacher educators lament, state policymakers went too far in the opposite direction and painted all teacher-training programs with the same broad brush.

"There are things that will not be provided to these teachers and will need to be provided to them on an inservice basis," warns Elaine P. Witty, dean of the school of education at Norfolk State, which eliminated several specialized methods courses.

At a time when the the number of troubled and disadvantaged children showing up at the schoolhouse door is surging, many educators suggest, prospective teachers need more—not less—professional training.

"What we're having to do," argues Richard L. Simms, associate dean for academic affairs at the University of North Texas, "is deal with a lot of very important subjects on a superficial basis. And we don't feel good about that as professionals. We're fearful about what that means when these new teachers get out into the public schools."

'The Only Profession'

In the past few months, 9 of the 26 Texas institutions that were once approved by NCATE have withdrawn from the accreditation process, including the University of North Texas. Officials say the school's decision stemmed, in part, from concerns that they could no longer meet the more stringent, national standards.

"We were due for an NCATE visit in February," Mr. Simms explains, "and all of the signs pointed to us being turned down."

"When that appears in the Dallas papers or the Houston papers," he argues, "the guy on the street won't understand that it was because of the state law—something outside of our control—and will assume incorrectly that it was because we had a crummy program. We weren't willing to take that risk, so we decided to withdraw instead."

Complains Mr. Kapel of Glassboro State: "We're the only profession that exists in which a state puts a cap on the amount of professional courses one can take. Can you imagine them doing that to a medical school or a dental school or a law school? There would be no way. They'd hang those people out to dry."

Confusing the Public

Ironically, notes Ms. Darling-Hammond of Columbia's Teachers College, some studies suggest that teachers who are professionally trained are rated more highly and produce greater learning gains among their students than those who are not.

Moreover, such positive effects are more often related to the completion of methods courses than to the completion of additional arts-and-sciences requirements, she states.

But such research is not widely known, even among teacher educators. And among the public at large—ranging from governors to state legislators—the popular perception persists that any chemist who likes children can teach chemistry effectively.

"I think that limiting pedagogy has had the effect of confusing people about what teachers know and are able to do that any generally well-educated liberal-arts person cannot do," says Sharon P. Robinson, director of the national center for innovation at the N.E.A.

"Until we have a way to clearly distinguish between what folks know who are

competent in teaching and others," she maintains, "we really can't get anywhere on this issue."

Meanwhile, other states may be looking toward Texas as an example. Last year, Georgia considered a bill that would have limited a prospective teacher's education courses to 30 semester hours. The bill passed the Senate education committee overwhelmingly. But its sponsor, State Senator John Foster, decided to put it on hold to allow the state boards of education and higher education to come up with their own solutions. Those proposals are expected next month.

In Mississippi, an advisory committee to the state board of trustees has recommended that the number of professional-education courses that can be required at state institutions be limited; however, the recommendations have not been carried out.

"There are many states that are giving such limitations serious consideration," says State Representative Lyle Sattes of West Virginia, "primarily because of the amount of effort it takes to reform an organization, as opposed to starting over."

Criticisms From Within

Among teacher educators themselves, criticisms of the professional-education curriculum are growing, although the complaints tend to be of a different nature.

Mr. Goodlad's study found that professional studies have changed little since 1963, when James B. Conant conducted a major national study of teacher education.

Then, as now, most prospective teachers complete a course or two in "foundations," or the history, philosophy, and sociology of education; a course in educational psychology or child development; a series of generic or specialized methods courses in how to teach; and student teaching—commonly in that order.

For prospective high-school teachers, the entire sequence may amount to no more than three or four courses in total, excluding the fieldwork.

"The curriculum in teacher education is really not coherent enough, and it's not focused enough," says Ms. Robinson of the N.E.A. "It's not clear what knowledge really is important."

Others note that most programs are not built around an articulated mission, a clear conception of teaching and learning, or an understanding of how teachers grow.

Questions of values, character development, and moral understanding, which should be at the heart and soul of teaching, are almost wholly absent, Mr. Goodlad says.

Of the 222 programs that have recently been reviewed by NCATE, 92 failed to meet a standard requiring that their programs be based on an explicitly stated philosophy that reflects both current research findings and sound practice.

More institutions failed this standard than any other approved in the redesign of NCATE three years ago. Eventually, Mr. Wise says, the new standard could serve to upgrade teacher-education programs, by requiring them to have a coherent view of the sort of teacher they want to produce.

"It's become my feeling that methods courses in teacher education suffer from two flaws as they're currently done," Ms. Darling-Hammond of Teachers College says. "Number one, they are too few and too broad and general."

"The second failing," she asserts, "is that, if they are kept too far divorced from practice or opportunities for practice, then it's hard to see how the methods are going to be applied or whether they're going to work."

How Teachers Learn

Others allege that existing programs fail to take into account new information

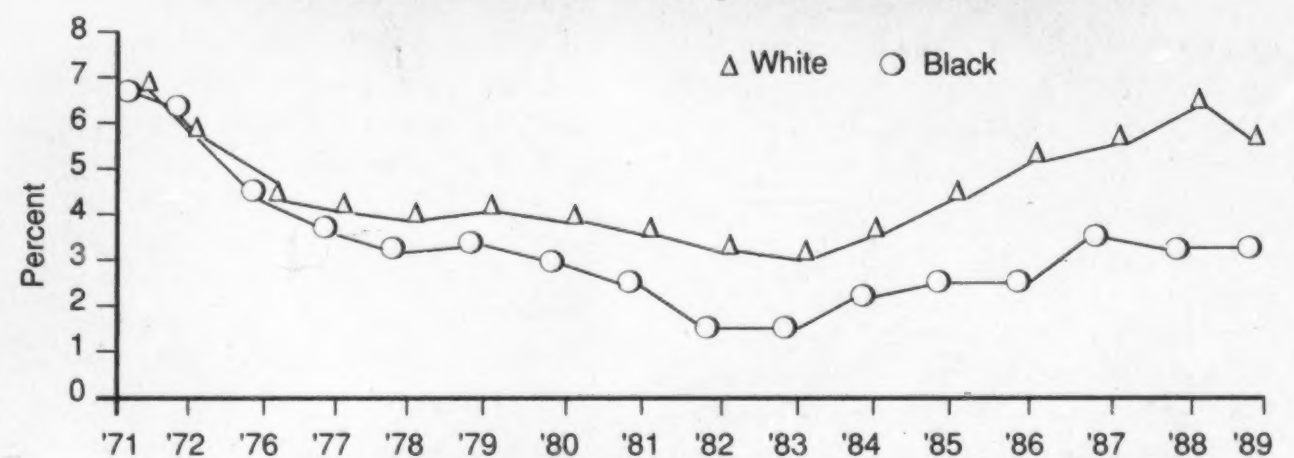
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College-Bound Seniors: SAT Score Averages, 1980-90

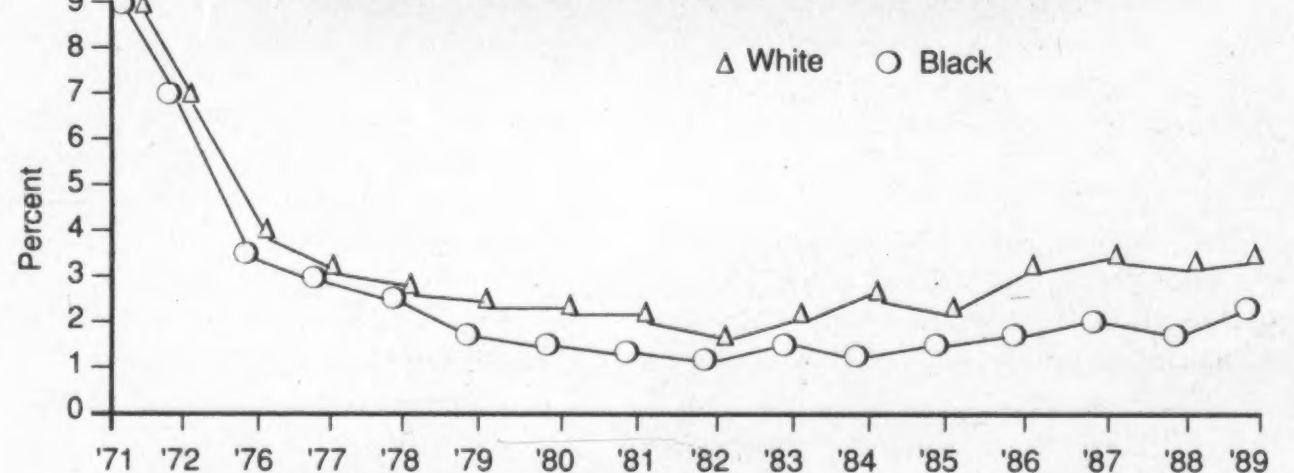
Year	Verbal		Mathematical	
	Total	Intended Education Majors	Total	Intended Education Majors
1980	424	389	466	418
1981	424	391	466	418
1982	426	394	467	419
1983	425	394	468	418
1984	426	398	471	425
1985	431	404	475	432
1986	431	—	475	—
1987	430	408	476	437
1988	428	407	476	442
1989	427	406	476	440
1990	424	406	476	442

Source: The College Board Admissions Testing Program

Percentages of Black and White Freshmen Planning Careers as Elementary-School Teachers



Percentages of Black and White Freshmen Planning Careers as Secondary-School Teachers



Source: The Black Undergraduate: Current Status and Trends in the Characteristics of Freshmen, Higher Education Research Institute, University of California, Los Angeles, 1990



More than 1,200 teacher-training programs—about twice as many as some educators think the nation can afford—turn out approximately 91,000 teachers a year at the undergraduate level.

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about how teachers and students learn.

Some research suggests that there should be more of a continuum between a teacher's preservice and inservice training, and that many things now learned on campus would be better learned on the job.

For example, most teachers complain that they never got enough instruction in classroom management before they began teaching, says Mr. Hawley of Vanderbilt, but studies have found that such lessons may be best learned after someone has already spent time in the classroom.

In contrast, he asserts, teachers probably cannot learn how to be reflective on the job if they did not bring that disposition with them.

By teaching the wrong things at the wrong time, Mr. Hawley maintains, teacher education has contributed to the dissat-

isfaction of its graduates.

Although the majority of education-school graduates say they feel ready to teach shortly after graduation, experienced classroom teachers give much lower marks to their preservice programs.

In addition, notes Ms. Kennedy of Michigan State, teacher education fails to challenge many of the already entrenched—and unproductive—views about teaching that future educators bring with them into their programs.

"When these people go through a teacher-education program," she asserts, "they sort of selectively reject anything that's not consistent with their own views. Then they walk out the door and the only things they've accepted are the things they already believed anyway. So they say, 'I didn't learn anything.'"

"What we have to do," she maintains, "is find some way to shake loose those beliefs, challenge them a little bit, and get them to think more critically about the assumptions they come with. And it's not clear

how you do that."

In Mr. Goodlad's study, the basic educational beliefs and values of nearly half the students remained unchanged throughout their teacher-education programs. Others saw themselves as becoming less idealistic and more practical over time.

'Rote Learning' Prevails

As educators strive to make teaching more of a profession, they are portraying an increasingly complex view of the effective practitioner.

Expert teachers, they suggest, should be able to reflect on what they do; appraise themselves with a degree of dispassionate analysis; employ new knowledge and skills over time; and gauge the immediate and on-going consequences of their behavior.

In contrast, most existing teacher-training programs, critics maintain, are focused overwhelmingly on "what works"—a bag of tricks that prospective teachers can bring into the classroom on Monday.

Mr. Goodlad found that most programs

stressed four or five different teaching techniques throughout a students' methods courses—often in lecture format—without any attempt to delve more deeply into their use or relevance.

In addition, he reports, "preparation programs were not deliberately developing the skills of discourse, debate, analysis of conflicting views, compromise, and the like required by faculties engaged in school renewal."

"The heavy dominance of lecturing by teacher-education faculty," he concluded, "(and the resulting passivity on the part of the students) allows little opportunity for critical, independent thinking to flourish among teachers in training. Not surprisingly, there is a considerable parallel between rote learning and passivity in teacher-education classes and the same methods in the elementary- and secondary-school classes observed in our earlier work."

'Not Beyond the Slogans'

Teacher educators still tread gingerly around such complicated and controversial findings.

"On the whole, we're not yet beyond the slogans," says Mr. Murray of the University of Delaware. "It's very, very hard, and that work is just starting."

Agrees Gary D. Fenstermacher, dean of the college of education at the University of Arizona: "Faculty learn over time not to have debates about changes in the nature of pedagogy, because they don't go anywhere. When you come back to the campus you have ego and turf, and those become the kinds of nasty realities of negotiating the curriculum. So progress is hard and slow."

One of the basic thrusts of the Holmes Group over the next 18 months will to produce a report on the professional curriculum for teachers, in hopes of overcoming such resistance.

More Time in Schools Not Necessarily Better

During the 1980's, many states tried to root teacher training more firmly in reality by increasing the amount of time that prospective educators spend in the schools.

Many states now require future teachers to have at least some exposure to the schools prior to their junior year in college. And they have extended student teaching from a quarter to a full semester.

Traditionally, teachers have rated these clinical experiences as the most valuable part of their education training. But more time spent in the classroom may not necessarily be better, many say, particularly given the problems with existing programs.

In general, student teaching is among the most poorly funded functions within schools of education, frequently left to adjunct and part-time faculty members.

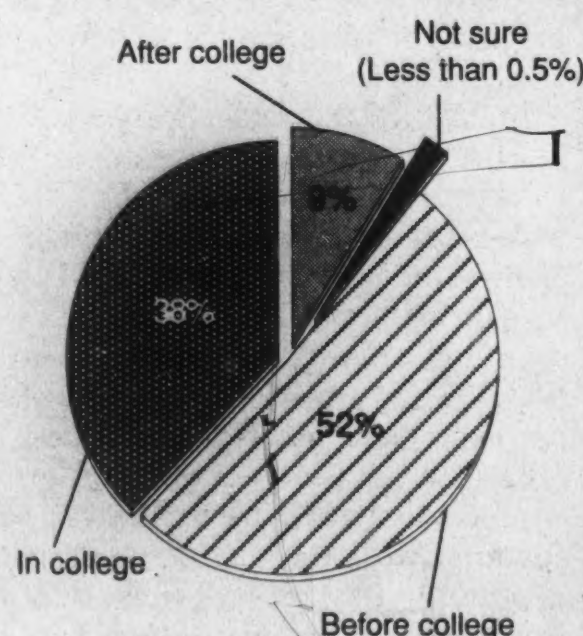
Supervising teachers in the schools, who agree to work with teacher candidates, are often unpaid and untrained. Frequently, they are matched arbitrarily with students on the basis of location and convenience, rather than on their ability to work with others.

Because students tend to work with only one teacher at a time, in an isolated classroom, they remain subject to the whims and the teaching style of that individual. In addition, they learn that teaching is essentially a solitary activity, and that their responsibility is to their classroom rather than to the school as a whole.

In many instances, notes Mr. Goodlad, supervising teachers engage in practices directly counter to what students are learning

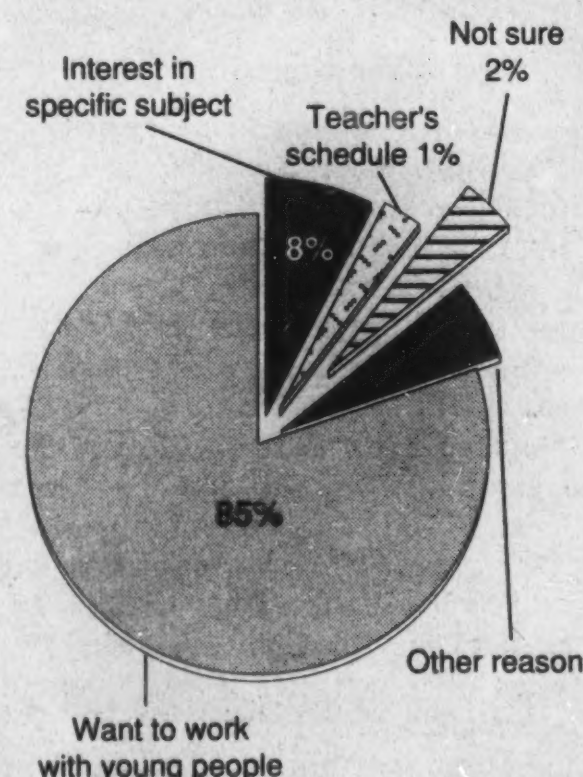
When Students Decide To Become Teachers

Did you decide to become a teacher before entering college, while you were in college, or after you graduated from college?



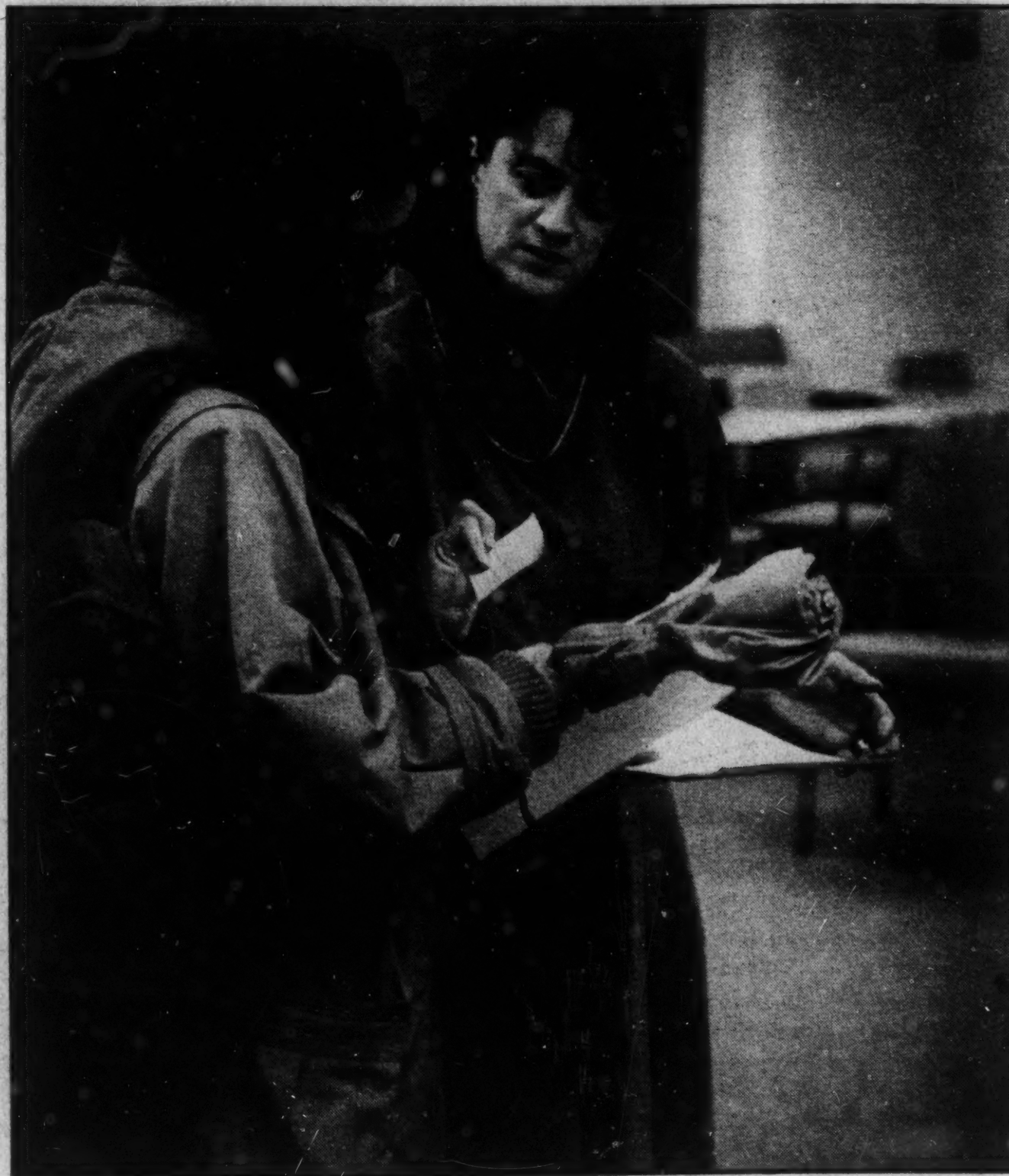
Why Students Choose To Teach

Which is the most important reason you chose to become a teacher? Is it because you want to work with and help young people, because of your interest in a specific subject (such as history), because a teacher's schedule fits best with your obligations, or for some other reason?



Base: 1,002 new graduates who expected to teach in a public school in 1990-91

Source: The Metropolitan Life Survey of the American Teacher, 1990



Candace Wood, right, a graduate assistant in the college of education at the University of Virginia, confers with a student, Jennifer Ricciuti.

Proximity of School of Education to Student's Home

How many miles is this institution from your home?

	Less than 20	20-50	51-100	101-500	501-1000	1001-2000	More than 2000
Whites	26.0%	20.1%	10.4%	25.3%	10.8%	4.5%	3.0%
Blacks	32.3	16.2	9.2	20.0	8.9	3.1	12.3
Hispanics	71.4	17.1	---	2.9	5.7	2.9	---
Asian/Pacific Islanders	29.4	11.8	5.9	5.9	5.9	---	41.2

Base: 472 third- and fourth-year teacher-education students
Source: AACTE/Metropolitan Life Survey of Teacher Education Students, 1990

on campus. Sometimes, they do not believe in these practices themselves, but are forced to comply with state or local regulations.

"Our data," he writes, "are disappointingly replete with examples of faculty members who told students encountering discrepancies between what they were being taught and what the district required of them simply to conform—to do what they believed right only when ultimately in charge of their own classroom."

An Incredible 'Discontinuity'

The result, says Mr. Hawley of Vanderbilt, is an incredible "discontinuity" between what students learn on campus and what they observe in schools, with the most interesting and sophisticated ideas about teaching least often reinforced.

Although teachers do not forget such ideas, he asserts, typically they file them away and discard them as impractical.

The new array of beginning-teacher programs—which provide some supervision and guidance for first-year educators—may exacerbate the problem still further, he notes. Most mentors have no knowledge of the university programs their students have come from or of what they have learned.

"What the students here are really realizing," says Elizabeth A. McAllister, a professor of education at Towson State University in Maryland, "is that they are getting the newest theories at Towson."

"And many of the teachers have been out there for 20 years, and they didn't have this training," she adds. "So it will be rare that they will have the same modeling that they are having here. They are guests in their classrooms, and they are not going to be able to go in and make any constraints or demands."

The assumption that future teachers will learn to become reflective and thoughtful practitioners primarily through prolonged student-teaching experiences "is certainly challengeable," Mr. Howey of Ohio State says.

"The real world is so practice-oriented and so fast-paced," he cautions, "it works against intellectual discourse."

Professional-Practice Schools

One solution being advocated by an increasing number of educators is the creation of professional-development, or practice, schools, similar to teaching hospitals in medicine.

In these specially designated public schools, jointly operated by the university and the school district, professors and teachers would work side by side to induct new teachers into the profession and to engage in ongoing research about practice.

Such programs are now in an embryonic stage in a number of places nationwide, including Louisville, Ky., Lansing, Mich., and White Plains, N.Y. Both national teachers' unions have also mounted initiatives to create such schools, in cooperation with teacher-education programs. But few of the problems of control, funding, or division of labor have been worked out.

In particular, it is not clear whether universities or school districts that have failed to invest much in student teaching before will make the commitment to finance such substantially more expensive programs.

"In my judgment, we've done student teaching on the cheap in the past," says William E. Gardner, dean of the college of education at the University of Minnesota, "and it's going to cost us more money to change and do it right or do it better."

Others are arguing for the development of carefully prepared case studies, such as those now used in business schools, to introduce prospective teachers to common dilemmas or problems in education.

Such thoughtfully constructed vi-

gnettes, combined with on-campus "pedagogical" laboratories—in which students could watch videotapes or simulations of real-life situations—would do more to help students become reflective practitioners than hours spent in schools where teacher educators have little control over what is observed, Mr. Howey of Ohio State says.

In one of the most extreme views, Mr. Hawley suggests that teacher educators might stop instructing students in teaching techniques altogether and turn that job over to the schools, "as the rest of our colleagues in the university have done."

By buying into the argument that a few weeks' increase in the amount of time spent student teaching will result in a markedly better teacher, Mr. Hawley warns, educators may be painting themselves into a corner.

In the end, Mr. Wise of NCATE says, the solution may lie in the expansion of first-year induction or internship programs, which recognize that education-school graduates are not yet full-fledged professionals, and that teacher training cannot be accomplished solely on campus.

Close to half the states now have some kind of mentorship or induction program for new teachers. But most are not funded.

"They're not great," Mr. Wise says, "but what's important is they've established the principle, and the principle is that fully formed teachers have not graduated from colleges of education—that they need to continue forming their skills under supervision."

Enemies of Change Without and Within

Why has teacher education been so slow to change in the face of such persistent and pervasive criticisms?

Observers point to several culprits, including scattered responsibility for teacher training within colleges and universities, severe underfunding of teacher-education programs, a lack of high-level university leadership, and overly prescriptive state rules and regulations.

Within colleges and universities, the business of teacher education is remarkably balkanized, spread out among faculty members in the arts and sciences, teacher education, and the public schools.

Reshaping even the simplest thing about a program means working across departments and institutions. Educators say the task is even more difficult than bringing about cohesiveness among high-school faculty members.

Traditionally, teacher education has also been one of the most poorly funded enterprises on university campuses.

According to Bruce A. Peseau, an expert on teacher-education finance, such programs carry the lowest weight of any academic discipline in most state-funding formulas. Within universities, teacher education has often functioned as a "cash cow," bringing in more tuition than it receives back in university allocations.

Most public universities fund teacher education at approximately the same level per credit hour as undergraduate courses in the arts and sciences, despite its often heavy clinical component.

In 1984, when Mr. Peseau, a retired professor of education at the University of Alabama, examined funding for business administration, engineering, and teacher training on one university campus, he found that teacher education was funded at 5 percent less than the engineering program and 14 percent less than the business program for the same weighted credit hour.

When those costs were multiplied by the total credit hours produced in the three colleges, engineering received \$555,000 more than an equitable sharing of funds would

have provided teacher education; business administration received \$972,000 more.

Indeed, less is spent to educate a teacher than a public-school student. In 1984-85, for example, the direct cost per K-12 student in California was more than \$3,000. The cost per undergraduate teacher-education student among 77 universities was only \$1,590.

In general, Mr. Peseau has calculated, training teachers costs anywhere from 19 percent to 47 percent less than educating precollegiate students, depending on the states and universities examined.

Such severe underfunding, Mr. Wise of NCATE says, "leads to the ironic situation of a professor of education lecturing 300 students on the merits of individualized education."

Faculty-student ratios in teacher training typically exceed those in other professional programs, so that many professors have too many students to supervise, too many courses to teach, and too little time for reflection.

Rhetoric, Not Money

Ironically, while state demands on teacher education have been growing, support for the enterprise has not.

As a result, many teacher-training programs are struggling to reform or maintain programs in the face of level or declining finances.

The college of education and psychology at the University of Southern Mississippi, for example, faces a 5 percent budget cut this year, according to Dean James O. Schnur. The reduction, which stems from the state's bleak fiscal situation, will affect programs institutionwide, he notes.

"It allows us to stay in a maintenance mode," he adds, "but reform and revitalization and restructuring have a pricetag attached to them."

The budget cut is the second one in seven years. At the same time, a surge in teacher-education enrollments has exacerbated the problem, because student tuition covers only 60 percent of the program's cost.

At the University of Minnesota, says Dean Gardner, "We've been essentially 'downsizing' for a number of years. What that means is we've had programs we've cut out." In the past 12 or 13 years, he estimates, constant dollars for teacher education have declined about 30 percent.

Michigan State, considered by many to be a star on the teacher-education map, has also faced budget cuts in 9 of the past 10 years.

And at the University of North Texas, enrollment in the undergraduate elementary-education program has increased 42 percent in the past three years, without a parallel increase in funding.

"We've barely been able to cope with that additional crush of students," Mr. Simms says. "The university simply hasn't had the funds to increase our budget commensurately, so we've had to tread water. We've used more part-time faculty."

Indeed, Cecil G. Miskel, dean of the school of education at the University of Michigan, warns that, given the increasingly grim fiscal outlook for most states, and the jaded eye with which some lawmakers are looking on higher education in general, teacher training could be in for some rough times.

"I think what we're facing in higher education over the next 10 years is stable to declining resources," he argues, "and higher-education administrators, whether they're in the school of education or engineering, are going to have to do a good deal of reallocation within their own units to programs that are important."

Lack of Leadership

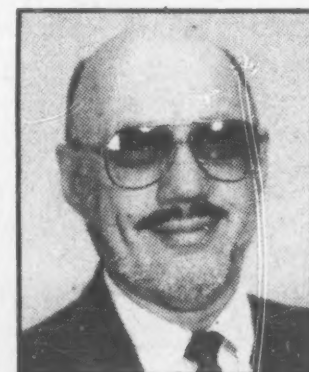
Most teacher educators are not particu-

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Taking the education of teachers seriously has been an irresponsibility . . . all the way around.

—Judith E. Lanier



We're the only profession . . . in which a state puts a cap on the amount of professional courses one can take.

—David E. Kapel



The curriculum in teacher education is really not coherent enough, and it's not focused enough.

—Sharon P. Robinson



Faculty learn over time not to have debates about changes in the nature of pedagogy, because they don't go anywhere.

—Gary E. Fenstermacher

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larly sanguine that central university administrators will look kindly on teacher education in a time of belt-tightening.

Robert C. Dickeson, president of the University of Northern Colorado, says most university presidents still "don't give a damn" about teacher training.

And Charles J. McClain, commissioner of higher education for the state of Missouri, says he sees no evidence that teacher education is any higher on the list of priorities of most university presidents.

University administrators, he notes, promote those programs whose graduates make a lot of money—and teacher education is not one of them.

In 1987, the American Association of Higher Education and Donald Kennedy, president of Stanford University, invited university presidents nationwide to endorse a statement on the reform of teaching and teacher education. Some 400 university presidents did so and wrote back saying that they wanted to become involved in promoting change on their own campuses.

In July 1988, the Presidents' Forum was established.

But two years and thousands of dollars later, there is little to show for that effort. Attempts by the A.A.H.E. to bring together presidents in Massachusetts, Virginia, New Mexico, and Washington did not lead to any major project, legislative proposal, or ongoing organization. And while individual presidents have proceeded to champion teacher education, many have not.

According to Russell Edgerton, president of the A.A.H.E., one of the problems was that presidents felt "no heat" to reform teacher training. "To many presidents, the problems we wanted to address are still remote," he asserts. "For all the talk about how bad teacher education is, we found few places where superintendents and principals were themselves complaining to presidents about the quality of the teachers they were getting."

In addition, colleges and universities that compete for students found it difficult to work together around a collaborative project. And university presidents, beset by other demands, often turned the agenda over to their staff members.

Even more important, Mr. Edgerton notes, many university presidents privately share the "common faculty stereotype that teaching requires subject-matter understanding and not much else—ergo, they don't really believe in their own schools. Others will defend the schools as they are."

For many, support meant hiring a good education dean, supporting him or her, and trying to improve communications with the arts and sciences. But it was unclear what other paths they could take. Although many were willing to serve as community spokesmen for teacher education, they were loath to take on the internal problems of teacher-education reform.

As Mr. Edgerton notes, "Who wants to get into trouble with their own faculty all by themselves?"

Turnover a Problem

Finally, the high turnover rate among central administrators has posed a tremendous problem for sustained reform.

Mr. Goodlad found that most university presidents remained in office only eight

years; provosts and academic vice presidents, less than five.

One of the most promising initiatives to come out of the President's Forum, Mr. Edgerton says, was the A.A.H.E.'s commitment to hold an annual conference on school-university partnerships.

In addition, Mr. Kennedy may work with his colleagues to reform the reward structure for hiring and promoting university faculty members. Such a change would have major ramifications for teacher education, given the fact that such activities as working with schools or supervising student teachers are seldom promoted or rewarded.

Mr. Dickeson of the University of Northern Colorado, who is now chairman of the Renaissance Group, a smaller coalition of higher-education institutions dedicated to the universitywide reform of teacher education, says he hopes to have learned from previous efforts.

Without the example of the President's Forum, he notes, the Renaissance Group may have never come into existence. Unlike the forum, the new organization hopes to stay small. It has already thrown out one institution whose president was not attending meetings, and its members must include both university presidents and education and arts-and-sciences deans.

The problem, says Mr. Howey of Ohio State, is that serious changes in teacher education will require collective or programmatic action on the part of university leaders, education-school deans, and others, not just the initiatives of individual faculty members.

"In many ways," says Ms. Lanier of the Holmes Group, "taking the education of teachers seriously has been an irresponsibility rather than a responsibility all the way around—sometimes in the education schools, sometimes in the arts and sciences, sometimes in the schools. And so it's a matter of getting the collective will."

Discouraging Innovation?

Teacher educators also maintain that state regulations and policies typically have discouraged, rather than encouraged, creativity and innovation.

Teacher licensing in most states is based, in part, on graduation from an approved teacher-education program. State program approval, in turn, is based largely on the provision of highly specified course content.

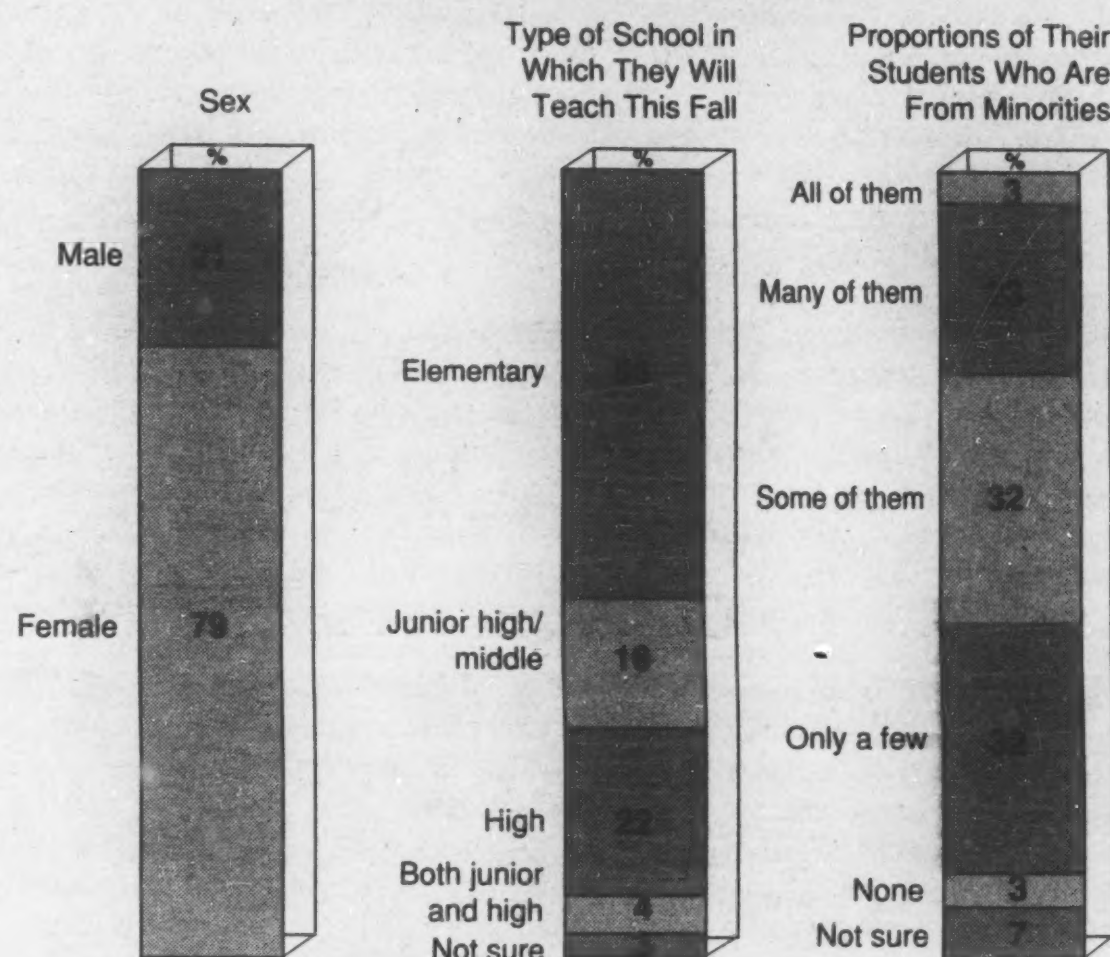
According to Mr. Goodlad, the result is that most teacher educators commonly square their curriculum with the most recent list of state mandates, "more or less resigned to circumstances beyond their control."

"The changing and often abrupt state intrusions into the curriculum of teacher education have effectively stifled the creative process," he charges. "Why bother to go through demanding, time-consuming efforts of program renewal when one must ultimately simply adopt or adjust to state-imposed requirements?"

For many years, Wisconsin had very minimal and ambiguous requirements for teacher education. Then, in the early 1980's, the Department of Public Instruction announced its intent to promulgate new program-approval rules. The new rules empowered the agency to review syllabi from any course in any department taken by an education student and decide whether the course was acceptable.

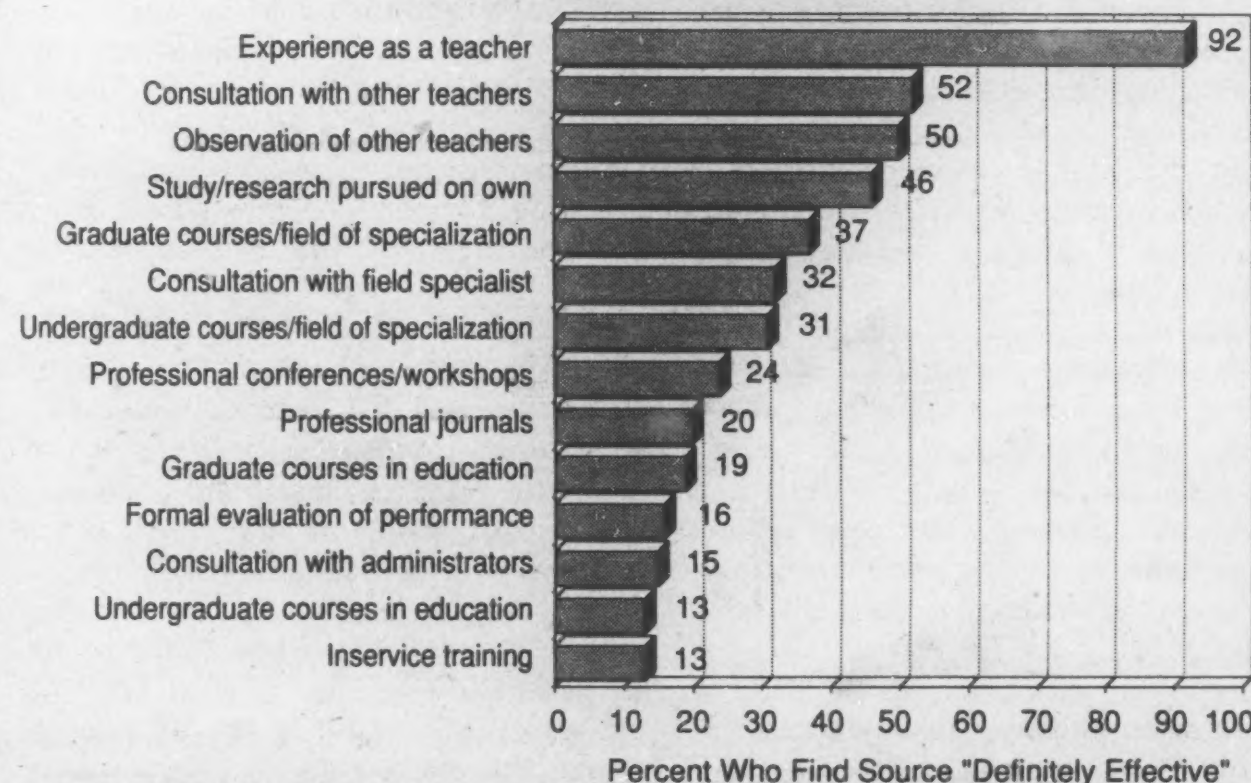
According to Jack M. Kean, a professor in the department of curriculum and in-

Profile of New Teachers



Base: 1,002 new graduates who expected to teach in a public school in 1990-91
Source: The Metropolitan Life Survey of the American Teacher, 1990

'Effective' Sources of Job-Related Knowledge and Skills



Base: Nearly 1,800 members of the National Education Association
Source: The Learning Workplace: The Conditions and Resources of Teaching, Organizational Analysis and Practice, 1986

struction at the University of Wisconsin at Madison, the new regulations were far too intrusive, requiring the university to teach prospective educators about education for employment, pupil-personnel services, and other issues best learned on the job.

After a series of complaints from the university's lawyers, the agency's lawyers concluded that the state could not exercise direct control of the university's curriculum, but it could control the requirements for teacher licensure—and, hence, the content that a future teacher was required to learn.

In many states, such content listings expand to hundreds of pages of program requirements that universities typically meet through the creation of specific courses. "No other profession has anything analogous to the program-approval process in teacher education at the state level," Mr. Wise of NCATE says.

Lots of Detail, Little Muscle

Ironically, despite the often burdensome nature of state program approval, it has seldom resulted in the closing of inef-

fective institutions.

According to Joni Finney, director of policy studies for the E.C.S., it is politically difficult for states to close down teacher-training programs. States are reluctant to become so involved in university prerogatives, she asserts, and they want to ensure that programs are available to students in all parts of the state.

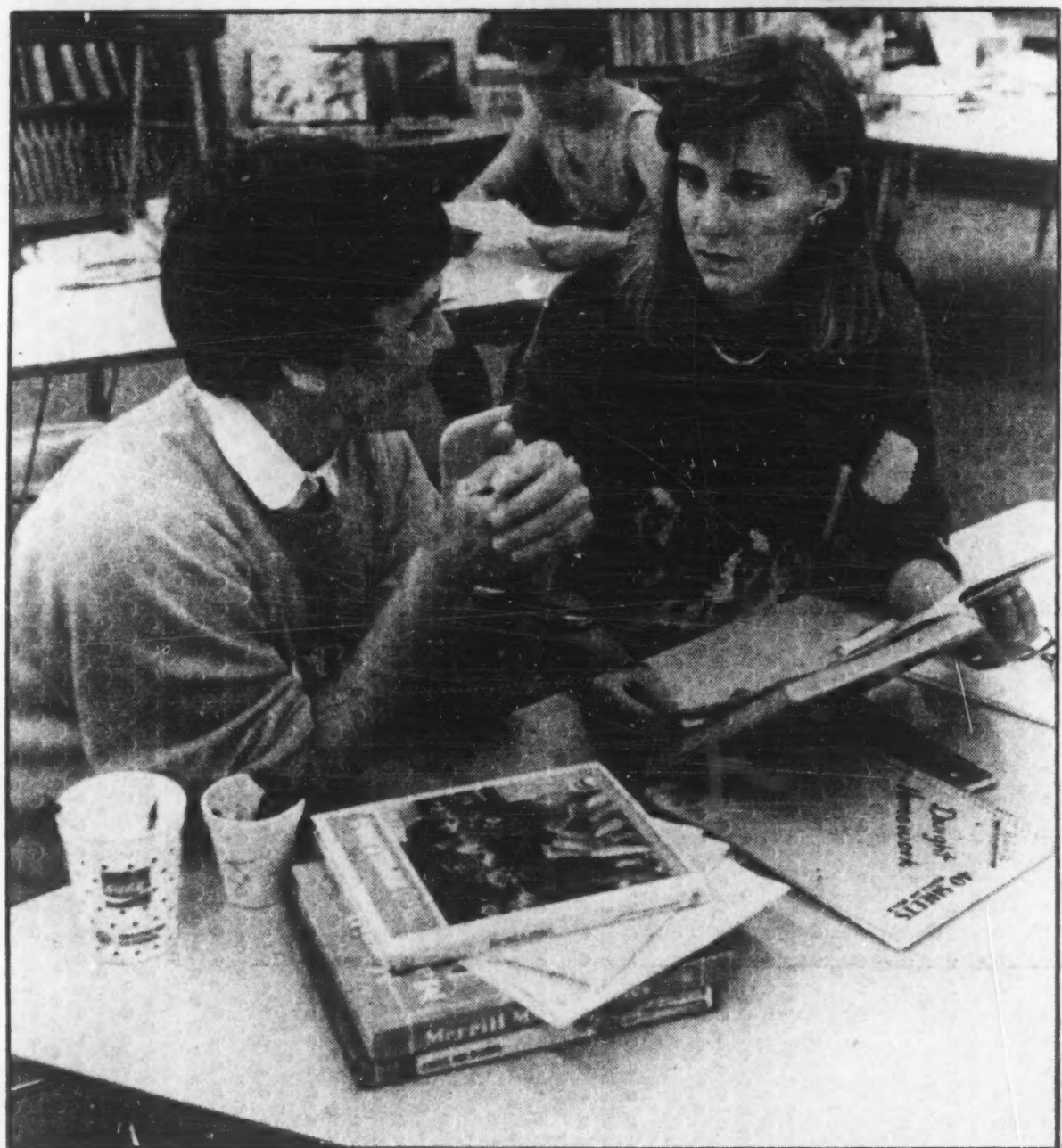
Because state agencies are responsible for ensuring both the quality of teacher-education programs and an adequate supply of new teachers, Mr. Wise argues, professional considerations are inevitably compromised. When the need for teachers goes up, standards for programs go down, he adds.

In addition, says Calvin Frazier, a professor of education at the University of Denver and a former state superintendent of education for Colorado, "the state process usually involves representatives from other colleges, who themselves are fearful of being attacked. So it's, 'I'll pat your back and you'll pat mine.' The integrity of those reviews just hasn't been there."

Until curriculum mandates and other detailed requirements are eased, teacher



University of Tennessee-Knoxville



Gerald Holly

One prominent complaint about teacher education in the early 1980's was the dearth of high-quality candidates. Since then, 45 states have moved to improve the caliber of prospective teachers—by limiting entry to teacher-education programs or by imposing new licensure requirements.

educators suggest, the incentives for innovation will be minimal.

Five Years by Default

Another ironic effect of state regulatory efforts has been the unconscious prolongation of teacher-education programs.

When the Holmes Group suggested in 1986 that most teacher training should occur over a five-year period, it set off a furor within the teacher-education community. Indeed, the question of whether teacher education should span four versus five years overshadowed almost all other debates about teacher training.

Today, maintains Lynn Cornett, vice president for state services for the S.R.E.B., "we're not seeing any mandate for five-year programs."

"We just aren't seeing many states move in that direction," she says.

But something different may be happening beneath the surface. As states have required more subject-matter preparation for prospective teachers, longer student-teaching experiences, and, in some cases, more pedagogy, many teacher-education programs have quietly expanded from four

to four and a half and even five years.

At Tennessee Technological University, Edell M. Hearn, dean of the college of education, says the curriculum is so tight "that it is very, very difficult for a student, if they get out of sequence, to get through in four years."

"The elective principle has been almost negated," he says.

And at the University of Wisconsin at Madison, Kenneth M. Zeichner, professor of curriculum instruction in the school of education, says new regulations have required most elementary candidates to take a minimum of nine semesters of instruction, "if you make no mistakes and you know right from the beginning what you want to do."

The majority of students now take at least five years to complete the program, he claims, as is true elsewhere in the state.

Indeed, Mr. Goodlad found that the heated debate among teacher educators about whether their programs should expand from four to five years has become largely academic. "The former is fast disappearing even where the latter has not been announced or legislated," he writes. "The liberal arts colleges in our sample appeared to be holding

closest to the four-year pattern, but even in these, the elementary-school preparation program was bulging at the seams."

The problem is that rather than moving conscientiously and purposefully toward such extended programs, it has occurred largely by default without any fundamental reconception of what or how students learn.

New Levers Needed For Fundamental Change

For fundamental reform to occur within teacher education, experts now suggest, different and more effective levers for change will be required.

"There really has not been any kind of incentive for colleges of education to change," contends Mr. Smith of the University of Florida. "If you start a new program, and if you have higher standards, and if your enrollment goes down, it's likely that your budget is going to go down. There hasn't been any proactive impetus to support change."

To remedy that stalemate, experts are suggesting a number of new incentives for the 1990's and beyond.

First and foremost, many contend, states should stop regulating the teacher-education curriculum. Rather, they should concentrate on outcomes and grant institutions greater flexibility in exchange for results.

"You can't hold people accountable if you tell them exactly how they have to do it," says Ms. Finney of the E.C.S. "States have got to get out of the business of telling people exactly what courses to take, how many, and that kind of thing."

Others suggest that NCATE standards should become truly national. Currently, the organization provides voluntary national accreditation to only 500 of the nation's more than 1,200 teacher-training programs.

Mr. Wise argues that every other established profession has a national accreditation agency that has developed a professional consensus about standards to which programs must conform.

"I think that growing frustration with the existing order is going to help underscore the importance of doing this," he maintains, "and I think, frankly, that this development is already under way."

Currently, 19 states have some kind of cooperative arrangement to tie their state program-approval process more closely with NCATE. Three states—Arkansas, North Carolina, and West Virginia—now require that their teacher-education institutions achieve NCATE accreditation in order to stay in business.

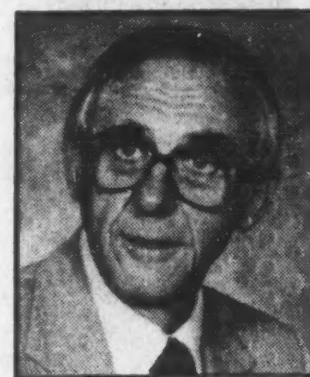
While the hope is that using NCATE standards will enable states to be tougher with ineffective programs, that has not yet proved true. So far, two institutions in Arkansas and West Virginia and one institution in North Carolina have failed their NCATE reviews. But officials in those states say the institutions probably will be given additional time to improve before any decision is made to shut them down.

The refusal by the National Board for Professional Teaching Standards to require candidates sitting for voluntary, national teacher certification to have graduated from an accredited teacher-education program was seen by many as a major blow in the move toward national accreditation.

"If you look at the politics of spending in universities," Ms. Darling-Hammond of Teachers College says, "they use the accreditation process as leverage to get more resources. One of the ways in which quality issues are addressed is by virtue of saying, 'We're going to lose our accreditation if we don't staff up.' Because many states don't take teacher-program accreditation seriously, there is no lever."

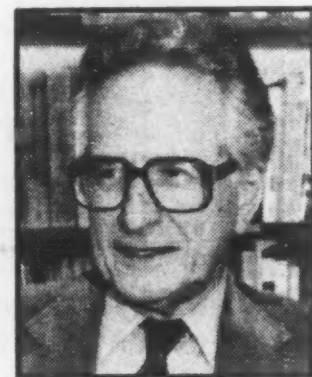
Others suggest that the reform of ac-

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We've done student teaching on the cheap . . . and it's going to cost us more money to . . . do it better.

—William E. Gardner



The changing and often abrupt state intrusions into the curriculum . . . have effectively stifled the creative process.

—John I. Goodlad



To say institutions aren't doing what we want them to . . . and fund them as we do is to have one's head in the sand.

—Linda Darling-Hammond



Photopress

What will be necessary to convince the public that schools of education are working is a [persuasive] licensing system.

—Arthur E. Wise

Teaching our Teachers

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creditation must go hand in hand with the reform of teacher licensure.

Currently, experts note, both policy-makers and educators distrust the ability of existing teacher tests and state licensing systems to differentiate between effective and ineffective teachers. As a result, they cannot be used to identify good teacher-preparation programs from bad, or to prove that such programs have an advantage over no preparation at all.

"What will be necessary to convince the public that schools of education are working is a licensing system for individual teachers that is persuasive, that really reveals when a person is ready to teach," Mr. Wise says. "Because there are no well-defined output standards now, schools of education are in trouble."

Agrees Mr. Fenstermacher of the University of Arizona. "Until the purposes or ends of initial teacher preparation are addressed, we are without standards or criteria to judge the merits of different programs. In the absence of clear evidence of success on well-grounded criteria, why should the state not permit a quicker, more simple route to licensure?"

Although states are moving to improve their existing teacher tests, Ms. Darling-Hammond says, "I can't think of a single state that is yet doing the kind of testing that would need to be done."

One hope is that the national teaching-standards board will design assessments that distinguish between effective and ineffective practitioners. If candidates with and without teacher training perform differently on such exams, it could shed light on whether professional education is either necessary or valid. The board plans to allow candidates to sit for assessments beginning in 1993.

According to many critics, the reform of teacher licensure also requires eliminating back-door, emergency, or substandard routes into teaching. As long as states continue to lower or discard their standards for teachers whenever warm bodies are needed, Mr. Goodlad notes, there will never be a firm incentive for education schools to graduate quality candidates.

Indeed, many note that the reform of teacher education is intimately tied to the reform of teaching itself.

As long as teaching and teachers are not valued, notes Ms. Finney of the E.C.S., "then anything having to do with that, especially teacher education, is at the bottom of the priorities."

Spending More Wisely

Finally, educators note, reforming teacher education will require both more money and a reallocation of existing resources.

Mr. Goodlad proposes that states continue to level-fund existing teacher-education programs, but distribute any new monies on a competitive basis. Such funds would go to a much more limited group of institutions that are engaged in reform or that have agreed to meet certain conditions for upgrading their programs.

A few states—such as California, Minnesota, and North Carolina—have already begun to make small amounts of money available for innovations in teacher training.

California, for example, spends approximately \$400,000 a year on five teacher-



During the 1980's, many states tried to root teacher training more firmly in reality by increasing the amount of time that students spend in the schools. The problem, many believe, is that more time in the classroom may not necessarily be better.

training sites that have agreed to reform their programs by working more closely with professors in the arts and sciences and with officials in school districts. In addition, these institutions must agree to provide better articulation between students' undergraduate majors and their fifth-year professional education.

Others suggest tying rewards directly to performance. Missouri, for example, has asked its institutions of higher education to develop performance indicators for all programs, including teacher education. Institutions that met those targets could receive as much as a 5 percent to 10 percent increase over their base-level funding. The legislature must still approve the appropriation.

"I think that's the only way you're going to bring about change," says Mr. McClain, the state's commissioner of higher education. "I don't think it's going to occur normally and naturally from within. Doing the right thing because it's the right thing to do isn't normally enough of a reward for college presidents."

He suggests that state officials and university presidents could also encourage innovation by ensuring level funding for teacher-education programs engaged in reform, even if their enrollments dropped. Because some states, such as Michigan, now produce three or four times as many teachers as they need, attempts to work within existing resource allocations by reducing the quantity of teachers produced may be one of the most hopeful avenues for success, says Mr. Miskel of the University of Michigan.

'We Have To Invest in It'

But others suggest that real change will require real dollars.

"If we want to improve it, then we have to invest in it," Ms. Darling-Hammond says. "To wring our hands and say teacher-education institutions aren't doing what we want them to do and continue to regulate and fund them as we do now is to have one's head in the sand."

She suggests that the federal and state governments make an investment in teacher education similar to that made in medical education over the years—an amount equal to hundreds of millions of

dollars since the 1960's.

Such money could be used to provide fellowships and grants, enrich training in particular areas, and create and identify professional-development schools and other models of best practice.

Mr. Goodlad advocates that institutions of higher education create "centers of pedagogy" dedicated to teacher training that would have their own faculty, budgets, and decisionmaking authority, similar to existing law or medical schools.

To create such programs and carry out 18 other necessary conditions for teacher education that he has advocated would cost between \$300,000 and \$1 million per institution spread out over a three- to five-year period, he estimates.

Ms. Lanier of the Holmes Group estimates that creating professional-practice schools would require an initial investment of approximately \$200,000 per school and about \$250,000 per year to operate.

While the cost would not be as high for every school, she cautions, "the resources are such that you can't find it in one place," but must rely on coalitions of state and local governments, universities, private-sector representatives, and the schools.

"While it's not a cheap proposition," she adds, "much of it can come from restructuring both at the school and the university level."

Window of Opportunity

What would fundamental change in teacher education look like, assuming that it could be achieved?

According to politicians and educators, such change would involve the recruitment of a teaching population drawn from the top, rather than the bottom, of the academic spectrum; programs with a clearly articulated vision of what teaching and learning is about that is communicated to faculty members, students, and cooperating professionals in the schools; serious efforts at cooperation between institutions of higher education and the public schools, including the joint appointment of faculty and joint funding and decisionmaking regarding teacher education; and serious proposals for curriculum reform, tied to new pedagogy, including the use of case studies.

But the bottom line, politicians maintain, is that more effective teachers would produce better results for students—in the form of lower dropout rates, higher test scores, and better college attendance.

After many years of neglect, experts assert, there finally may be a window of opportunity for serious reform in teacher education.

Just last month, the Exxon Education Foundation granted Mr. Goodlad's Center for Education Renewal \$1.25 million to carry out his ideas over the next five years. Other corporate and private philanthropies have indicated a similar interest in teacher-education reform.

At the federal level, Secretary of Education Lauro F. Cavazos has appointed a special adviser on teacher education. Last week, the department hosted a national conference on improving the quality of teacher education through increased flexibility and accountability.

In addition, the first teacher-training and education bill in years is expected to be reconsidered in the Congress again next session.

According to Ms. Lanier, it was only in the latter half of the 1980's that teacher educators began constructing a series of alternative visions for teacher education.

"The 1990's are really going to be known for substantial actual change and pilot work," she predicts, "and for the construction of these alternatives so that you can see them in reality and in practice."

"But," Ms. Finney cautions, "we really think the time frame in which to get something constructive going is not very long."

"I think there is both a dissatisfaction which is propelling the desire for reform and a willingness on the part of schools of education to undertake reform," Ms. Darling-Hammond says, "a willingness of the sort we certainly haven't seen for a very, very long time."

"If we blow it this time," she cautions, "we probably won't come back upon it for another 20 or 30 years."

This special series on teacher education is being underwritten by the John D. and Catherine T. MacArthur Foundation.

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Detroit May Ask Private Schools To Join System

Legal, Political Hurdles To 'Charter' Plan Seen

By Peter Schmidt

The Detroit Board of Education has agreed to consider a landmark proposal that would allow some private schools in the city to become public schools paid for out of public funds.

The board voted unanimously at its Jan. 22 meeting to begin a series of hearings and debates designed to develop a legal charter that, if adopted this spring, would enable private schools to join the public-school system as early as next fall.

The intent of the charter, board members said last week, would be to bring students and state aid back into the public schools, to help decentralize the system, and to offer public-school students more educational choice.

The charter is still very much in its conceptual stage, and numerous legal, political, and labor-related questions need to be addressed before the first private school can be chartered as public, board members and experts on educational governance stressed last week.

"The first hurdles that they are going to have to cross are the constitutional hurdles," said Robert G. Harris, a spokesman for the Michigan Department of Education, noting that the state Constitution prohibits the use of public funds at private schools except for transportation.

Joe L. Greene, president of the 1,135-member Organization of School Administrators and Supervisors, an affiliate of the A.F.L.-C.I.O., said he would do "everything possible to stop public funds from being spent at a private school."

Noting that parental dissatisfaction with public education is the reason most private schools in the city exist, John M. Elliott, president of the Detroit Federation of Teachers, said he wondered "what makes

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Richards Buys Texas Educators' Hopes for Reform

By Lonnie Harp

AUSTIN, TEX.—Bad news arrived here last month in Texas-sized portions.

Even though last year's rapid rise in oil prices had helped buoy the economies of neighboring states, Texas lawmakers still found out that they were nearly \$5 billion short of balancing their two-year budget.

Then came the unexpected word from the state supreme court that the legislature would be given only a little more than two months to invent a new method of financing the nation's second-largest state school system, or face a possible court-ordered school shutdown.

It was against this sobering backdrop that about 250 teachers, administrators, and parents from around the Lone Star State gathered here Jan. 26 to contemplate the future of education.

So why, an onlooker wondered, were these people smiling? Much of the reason, it turned out, entered the Joe C. Thompson Convention Center here dressed in green.

For Ann W. Richards, Texas' feisty new Governor, the meeting marked not only the fulfillment of a campaign pledge, but also an effort to spark grassroots interest in and support for education reform.

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Gov. Ann W. Richards of Texas signs autographs after meeting with teachers, administrators, and parents in Austin.

Backed by N.E.A., Memphis Schools Serve as 'Laboratories' for Reforms

By Karen Diegmüller

MEMPHIS—Beware of the Vipers.

Two years ago, police received as many as two dozen reports of assaults, larcenies, and trespassing at a tough, inner-city junior high school here whose students are known by that intimidating nickname.

Today, visitors to Vance Junior High School are likely to be beaten—on the basketball court, by the undefeated girls' team—or ambushed, albeit courteously, by student reporters gathering information for the school's twice-daily news broadcasts.

"Three years ago, we were classified as a war zone. Now we're a school," said the Rev. Maurice Dickerson, a parent and president of the local school council that governs Vance.

This year, a single assault and a couple of trespassing problems have been reported,

according to Larry Hill, security supervisor for the Memphis public schools.

The transformation of Vance Junior High into a graffiti-free institution whose students and teachers alike evince unbounding pride and enthusiasm is an early success, local school officials say, for a homegrown reform project that has earned the backing of the nation's largest teachers' union.

Bordered by abandoned buildings and rows of public housing, Vance is one of seven troubled schools here that were selected in 1989 to pioneer a district initiative encompassing site-based management, shared decisionmaking, and deregulation.

Conceived by Superintendent of Schools Willie W. Herenton and supported by the Memphis Education Association, the initiative was subsequently designated a Nation-

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Rochester Contract Woes Ignite Debate Over 'Accountability'

By Ann Bradley

ROCHESTER, N.Y.—The seven-month search for a way to incorporate the concept of "accountability" into Rochester's teaching contract has ignited a contentious debate here about what the word means and how to achieve it.

With two failed tentative agreements behind them, the Rochester Teachers Association and city school district are now awaiting the assistance of state mediators in reaching another agreement.

The fact that the union and the school district were twice able to reach tentative agreements containing accountability provisions is evidence, experts said last week, of unprecedented progress toward addressing one of the most difficult concepts in school reform today.

But in Rochester—where school reform has been a topic of discussion since the mid-1980's—grave concerns about New York State's economy and a political climate that has fixed attention almost exclusively on teachers' salaries have overshadowed those achievements.

The uproar that has followed the defeat of the two contracts—in September by the teachers' union and Jan. 23 by the Roches-

Continued on Page 14

Student Activism Forces Schools To Revisit Free-Speech Policies

By Mark Walsh

A surge in student activism touched off by the Persian Gulf war is confronting schools with freedom-of-expression issues on a scale many have not seen since the Vietnam era.

In recent weeks, students—and sometimes their teachers—have staged marches, sit-ins, walkouts, and other demonstrations designed to spotlight their views on the conflict with Iraq.

Others have expressed their views more quietly, by wearing buttons, armbands, or ribbons in support of or opposition to United States policy.

The activities have prompted many school administrators to seek legal advice on how to strike a balance between respect-

ing students' and teachers' rights to freedom of expression against the need to protect the educational process from disruption.

Among dozens of incidents nationwide over the past month:

- At Bonita High School in La Verne, Ca-

WAR IN THE GULF

lif., a 17-year-old senior seized the public-address microphone on the morning of Jan. 15, the day of the United Nations deadline for Iraqi withdrawal from Kuwait, and said, "Now is the time to save the world." That was the prearranged code for an antiwar walkout that included 250 stu-

dents. The girl making the announcement and another girl were briefly threatened with transfer to another school for leading the protest.

• About 150 students walked out of their classrooms at Martin Luther King Jr. High School in Cleveland on Jan. 17, the day after war broke out. They held an hourlong rally across the street from the school before returning to class.

• A Jan. 17 protest at Carlmont High School in Belmont, Calif., resulted in a melee that got so out of hand, according to school officials, that local police were called to restore order.

The incident began when some 75 students opposed to the war walked out of class and sat down on the football field, where

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Also in the news

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A New Entrant

A new organization has joined the growing chorus calling for a national achievement test for students.

IN SUMMARY

Teaching Teacher Educators

Under a plan approved by the leaders of the Holmes Group, Ohio State University is slated to receive a new center that will help teachers educators improve their own teaching. **Page 5.**

Lead-Screening Suit

Environmentalists and child advocates are suing the state of California for failing to provide routine lead-poisoning screening for all poor children in the state as required by federal law. **Page 8.**

Childhood Calamities

A new report documents substantial increases in the numbers of children living in poverty, giving birth as unmarried teenagers, and suffering violent deaths. **Page 9.**

'Writing to Write'

Aiming to increase its share of the school-computer market, the International Business Machines Corporation has introduced a companion to its "Writing to Read" series. **Page 11.**

Rapid Action

Moving at breakneck speed, the Arkansas legislature endorsed a plan for new education funding and a 10 percent pay raise for the nation's lowest-paid teachers and administrators. **Page 18.**

A New Service Model?

Gov. Pete Wilson of California has called for unprecedented, wide-scale collaboration between schools and social-service agencies in an effort to prevent social problems before they start. **Page 19.**

Few Clues

Rumors notwithstanding, President Bush did not use his State of the Union Message last week to clarify his position on school choice, nor did he say much about education in general. **Page 22.**

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ACROSS THE NATION

NATIONAL

Consortium Urges 'Shared Vision' In Providing Services to Children

To avoid passing "like ships in the night," human-service and education agencies should establish a "shared vision" that involves all key players, sets realistic goals, and promotes partnerships to institutionalize reforms, a new report on interagency linkages concludes.

The report, published by a consortium of 22 national human-service and education organizations, argues that progress toward serving large numbers of children and families comprehensively is possible "only when communities move beyond cooperation to genuinely collaborative ventures" in both service delivery and system reform.

Such partnerships should offer easy access to prevention, treatment, and support services; empower and address needs of the whole family; adjust services to meet

changing needs; and highlight outcomes, the report says.

The document identifies factors critical to successful partnerships, describes promising interagency initiatives, and offers guidelines for practitioners.

The report is the second on interagency linkages published by the consortium, which includes such groups as the National Governors' Association, the American Public Welfare Association, the Children's Defense Fund, and the Council of Chief State School Officers. The first report explored the potential for collaboration under the new federal welfare-reform law, and a third slated for this spring will address questions on collaboration by state and local policy-makers.

Copies of the report, "What it Takes: Structuring Interagency Partnerships to Connect Children and Families with Comprehensive Services," are available for \$3 each from the Education and Human Services Consortium, c/o the Institute for Educational Leadership, 1001 Connecticut Ave., N.W., Suite 310, Washington, D.C.

20036-5541.

■ Nearly 4,000 high-school students who took the College Board's biology achievement test last June have had their grades revised as a result of a scoring error.

About 3,900 of some 27,000 students who took the test received the revised scores after experts identified a second correct answer to one of the questions during a routine review of the test.

Affected students' scores were increased by 10 to 20 points, officials said.

The question asked students to identify a special layer of cells near the point of attachment of a leaf to a shoot. The correct answer to the question was intended to be the leaf scar. But during the test review, some botany experts noted that, given the diagram included with the question, such a layer could have been expected at other sites.

Achievement-test score revisions are extremely rare, according to Janice Gams, associate director for public affairs at the College Board.

STATES

Record Number of New England Schools Face Accreditation Loss

Forty-five high schools throughout New England have been warned that their accreditation is at risk because of cuts in programs or deteriorating school conditions.

The New England Association of Schools and Colleges cited cuts in library services, guidance counseling, lack of maintenance at some school buildings, and unsafe building conditions as among the factors causing the schools to be warned, according to Pamela Gray-Bennett, the group's associate director for public secondary schools.

The number of schools to receive the warning has increased dramatically in the past year, she added.

Six of the 45 high schools face the possibility of being placed on probation, while the 39 others have only been warned, the

association said. The names of the schools were not released.

Many school districts throughout the region have had to cut budgets in the past two years as a result of the softening New England economy.

■ Many of the largest employers in Idaho have sponsored a new report that recommends that the state spend an additional \$5.6 million this year, and \$100 million over the coming decade, to improve precollegiate education.

The report, which was sponsored by the Idaho Education Project, a coalition of 25 enterprises, recommends that the state move toward a performance-based system that would allow districts local control over how to meet new statewide goals.

Outstanding schools should receive grants of \$300 to \$500 per pupil and waivers from most state regulations, the report urges.

The study cost \$400,000 and took more than a year to prepare.

DISTRICTS

Black, White Miss. Districts Cannot Merge, Appeals Court Rules

The U.S. Court of Appeals for the Fifth Circuit late last month affirmed a lower-court decision preventing the merger of two Mississippi school districts.

The unanimous three-judge appellate panel upheld a federal district judge's 1989 denial of the bid by the predominantly black Laurel School District to merge with the surrounding Jones County School District. Most students in the county schools are white. The Laurel schools sought the merger in 1987.

"The law has been correctly applied," the appeals court held. "Federal courts may impose a desegregation remedy only if a Constitutional violation is shown."

The federal government, the City of Laurel, and the Laurel schools backed consoli-

Bursting Their Balloons?

Balloons, once a source of unmixed joy for children, today evoke as many "Oh no's!" as ooh's and ah's.

Disturbed by reports that balloons released into the environment have been linked to the death of marine animals, some children have begun to shun balloons, and schoolchildren have been active in lobbying state legislatures to act against outdoor balloon launches.

Under such pressure, legislators in Florida, Connecticut, and Texas have already responded by passing laws banning or restricting balloon launches, and California recently banned the release of foil balloons, according to Mark Brown, director of communications for the National Association of Balloon Artists. Several cities have passed ordinances labeling balloon launches a form of littering, Mr. Brown says, a term he thinks is unfair.

The youthful lobbying was prompted by reports in 1985 and 1987 that a whale and a leatherback sea turtle that washed ashore dead in New

Jersey had, respectively, a mylar plastic balloon and a latex balloon in their digestive systems that may have contributed to their deaths.

Peter and Susan Hibbard, science teachers in Toms River, N.J., founded the Balloon Alert Project in 1987 to study plastic pollution. Mr. Hibbard says he suspects that the balloons had "some impact" on the animals' deaths, even though no link has been proved.

The Hibbards say they are not anti-balloon. Ms. Hibbard, her husband says, regularly uses balloons in science experiments with her high-school students, who then demonstrate their proper use to elementary students.

But the balloon industry is not taking the controversy lightly.

One manufacturer, Balloon City USA of Harrisburg, Pa., has filed a civil suit against the Balloon Alert Project, claiming the project's efforts have hurt sales and damaged the firm's reputation, says its president, Philip Levin.

The firm has also responded with "A Lesson About Latex," a comic book



presenting the industry's arguments that the marine deaths may well have been unrelated to the balloons and that latex balloons are a natural, biodegradable product. The comic also includes three experiments schoolchildren can perform to prove the biodegradability of latex balloons.

—V.L.J.



A Union (N.J.) High School student works in a "microsized" ChemCom laboratory. Microsizing means that students use less, generate less waste, and operate safer and smaller equipment, developers of the chemistry curriculum say.

from—and some students argue, less rigorous than—traditional chemistry.

"It's a curriculum in which the chemistry is presented when students need to know it," Mr. Berry says.

The concept of balancing equations, one of the basics of traditional courses, for example, first appears in the chapter on conserving the earth's resources.

But if it is taught properly, supporters say, ChemCom does not weaken exposure to mathematics and theory.

"This is not 'dumbed down' chemistry," Ms. Ware says.

'Town Meetings' Held

The hallmark of the program, most observers agree, is its emphasis on the ways the knowledge of chemistry, or lack of it, affects students' daily lives.

The initial section of the textbook, for example, presents a situation in which the

residents of a fictitious small town discover that some substance in the local drinking-water supply is responsible for a massive fish kill that threatens the town's economy.

Students then are led through an examination of water-quality issues, as well as the chemistry of water, and learn to filter contaminated water through a variety of media to remove impurities.

The culmination of the section is a "town meeting," in which students debate the various causes and effects of—as well as the relative merits of solutions to—the water-quality problem.

"It was really like you lived in a small town," recalls Gregory Ponzoli, a junior in Mr. Rosso's class. "Everybody was getting real excited about it."

As a testament to the project's success, Mr. Rosso has displayed photographs of the town meeting, which was held early in

the fall semester, alongside the ubiquitous Periodic Chart of the Elements on his classroom wall.

Difficult To Teach?

Despite the growing enthusiasm for the program, however, acceptance is far from universal, even among those who have taught the course.

Many teachers who are pleased with the results of the traditional approach, and who see no value in reducing the amount of direct instruction in theory, object to the curriculum, proponents say.

"I think most of the resistance comes at the teacher level," Mr. Berry says.

Some teachers also object to the frequent homework assignments that are a hallmark of the ChemCom approach, Mr. Pavelich adds.

"From the teacher's point of view, there's an awful lot of grading," he says.

The inclusion of such activities as the simulated town meeting, which requires that students not only develop some expertise in chemistry, but also employ some skills that generally might be considered more appropriate in a speech or debate class, also spurs resistance among more-traditional teachers, according to some.

Mr. Rosso says that ChemCom initially "got a bad reputation in our county, because it was taught wrong."

Chemistry teachers, accustomed to the mathematics-based general chemistry program, he points out, attempted to shape the new curriculum to meet the old model.

"It's important to understand the philosophy behind the program," he says. "But, if you stay with the program, it'll all get done."

Learning 'Different Skills'

To most science educators, ChemCom is most appropriate for students who do not plan to take higher-level science or engineering coursework.

In Baltimore County, for example, where the course is offered as an alternative to honors, "gifted and talented," and

regular chemistry, the course catalogue stresses that ChemCom "is especially suited to the student who is not preparing for a career in science or engineering."

Yet the prerequisites for ChemCom are identical to those listed for the school system's traditional basic chemistry course. Students are required to have completed a first-year algebra course and should be concurrently enrolled in a second year of algebra.

To Mr. Pavelich of the Colorado School of Mines, ChemCom is an adequate preparation for high-school physics and provides an excellent grounding in the subject for non-science majors.

But Mr. Berry of the University of Puget Sound suggests that students who have taken the course can keep up in his college-level chemistry courses.

"ChemCom students end up with slightly different skills," he says. "But it's not that that stuff is lacking in ChemCom."

He adds that while ChemCom students "may feel a little stressed" during the early weeks of college chemistry, which typically emphasizes mathematics, they generally catch up with their peers because ChemCom has built up their self-confidence.

The group-oriented, interpretative approach also has its advantages, he notes.

"They can negotiate with other students easier, and they form study groups," Mr. Pavelich agrees. "ChemCom has students looking at graphs and tables of data and trying to get information, rather than solving a particular problem for a particular solution."

To students, though, ChemCom's greatest virtue is in bringing new relevancy to a subject that often is complex and daunting.

Brad Pressler, a junior in Mr. Rosso's chemistry class, had been enrolled in a traditional chemistry program at a Midwestern high-school.

"That was like math class," he says, carefully pouring a black liquid from one container to another. "This is more like chemistry."

Q. What is "shared inquiry"?

A. A distinctive part of the educational mission of the foundation is to teach teachers and parent volunteers in how to lead [a] very special, open-ended discussion.

In our workshops, adults are taught how to read interpretively and pinpoint questions of interpretation that are of interest to them. In other words, they might read "Jack and the Beanstalk," and after reading it two or three times and taking their own notes, they learn to write their own questions that are real to them.

They aren't going to say, "Who was the first person Jack talked to after he left home?" That's not an interpretative question. The teacher knows the answer to that, and the children know the teacher knows the answer so they don't have a genuine collaborative inquiry into the meaning of the tale.

But after really trying to grapple with the text herself, [the teacher] might come away with this question: Why does Jack climb the beanstalk again even though he's got inexhaustible wealth from the hen that lays the golden eggs? Children know the teacher is asking a genuine question, and then you've got a really genuine learning situation. The children and the leader try and work together to try to understand what the profundity of "Jack and the Beanstalk" really is.

Q. What is the value in that kind of inquiry for young children?

A. It teaches you how to think. It makes a child's education an active process, as opposed to passively absorbing that information the way an awful lot of children's routines require them to do. They are being taught tools for finding out the answers themselves . . . and that is something children can learn from a very early age. Even before those kids can decode they can think about literature and be moved by literature.

Q. Don't young children get frustrated that no authority figure can give them the "right answer" to questions about the literature?

A. We don't say there are not right answers. We say there are several good answers that are possible. It's not the case that any answer will do. It has to be an answer that they will support.

If the teacher says, "Why did Jack climb the beanstalk for the third time?" a child couldn't say, "His mother told him to," because there's not evidence to support that. But he might say Jack wanted to destroy the ogre and point to places in the text that show that the ogre is wicked and needs to be destroyed. . . . Children don't get frustrated by that, especially when they're taught early on that there are many different perspectives.

For many kids, this is the first time a teacher or an adult has looked to them for insight to a real question.

DIMENSIONS

Students' Interest in Mathematics

Students' enthusiasm for mathematics declines sharply during adolescence, particularly among girls, a survey commissioned by the American Association of University Women has found.

The poll of 2,500 girls and 500 boys, released last month, found that math is students' favorite subject in elementary school. Some 81 percent of elementary girls and 84 percent of elementary boys say they like math, the survey found.

But by high school, it states, 72 percent of boys and 61 percent of girls say they like the subject. More than a fourth of high-school girls say math is their least-favorite subject, it found.

Students' confidence in their own math abilities also declines over that period, and girls' confidence drops more sharply than boys', the survey found. In addition, it found, older girls tend to say they dislike math because they get "bad grades," while boys say they think the subject is "not useful."

Interest in Mathematics by Grade and Gender

